

Remarks

The present Amendment is made in response to the non-final Office Action dated October 2, 2006, and identified as Paper No. 20060919. Claims 1-9 and 11 are pending in the application.

In the Action, the Examiner rejected claims 1, 12, 16, 18, 20, 30, 34, and 45 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,873,875 to Altshuler (*Altshuler*). Claims 2-7, 9-11, 21-25, 27-29, 31, 35-40, 42-44, and 46 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Altshuler* in view of U.S. Patent No. 5,040,539 to Schmitt, et al. (*Schmitt*). Claims 8, 26, and 41 were rejected under 35 U.S.C. 103(a) in further view of U.S. Publication No. 2001/0018554 to Yamashita et al. (*Yamashita*). Additionally, claims 14, 32, and 47 were rejected under 35 U.S.C. 103(a) as unpatentable over *Altshuler* in view of U.S. Patent No. 6,436,127 to Anderson et al. (*Anderson*). Claims 15, 33, and 48 are rejected under 35 U.S.C. 103(a) as unpatentable over *Altshuler* in view of U.S. Publication No. US 2002/0026127 to Balbierz et al. (*Balbierz*). Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Altshuler* in view of U.S. Patent No. 5,109,859 to Jenkins (*Jenkins*), and claim 19 is rejected under 35 U.S.C. 103(a) as unpatentable over *Altshuler* in view of U.S. Patent No. 5,202,939 to Belleville et al. (*Belleville*).

I. Rejections in view of *Altshuler* under 35 U.S.C. § 102

As recited in claim 1, the present invention comprises: (a) means for generating light of a first frequency; (2) transmitting means for transmitting said light of said first frequency into said tooth; (3) detecting means for detecting shock waves induced in said tooth by said transmitted light of said first frequency; and (3) processing means for processing said detected shock waves induced by said transmitted light of said first frequency to measure said erythema in said tooth.

Thus, the present invention illuminates a tooth and detects whether any shock waves are induced by the light in order to *measure the degree of erythema*, and thus the relative health status of the tooth.

Altshuler, which was the primary reference used by the Examiner to reject every claim of the present invention, is directed toward a system for the performing surgery in the oral cavity using pulsed lasers. In particular, *Altshuler* discloses the use of pulsed lasers and a detector comprising a spectral analyzer or infra-red detector for interpreting radiation reflected or emitted from a tooth. Col. 4, line 48 – col. 5, line 44. *Altshuler* also discloses the use of a sound detector to register acoustic waves caused by the destruction of tissue by the laser. Col. 6, lines 1-12. As noted by the Examiner in the rejection, *Altshuler* measures the destruction of tissue (*i.e.*, necrosis) as a way of assisting with laser surgical operations.

The claimed invention for *diagnosing* tooth disease (by measuring the degree of erythema) is significantly different from the *surgical* system of *Altshuler* that measures the destruction of oral tissue. In particular, the claimed invention requires means for processing said detected shock waves induced by said transmitted light of said first frequency to measure erythema in the tooth. As explained in the specification of the present application, the health of the pulp of a tooth may be determined by measuring the vascularity or blood supply as the presence of *erythema*, or inflammation of the blood vessels, is indicative of disease. *See, e.g.*, Paragraph [0016]. As explained above, however, *Altshuler* measures sound waves as a proxy for *necrosis*, *i.e.*, the rate of destruction of tissue, as a means of assisting in laser operations that are destroying the teeth. The measurement of degree of shock waves in a tooth to determine the amount of erythema of the claimed invention is not the same as or comparable to the measurement of the sound of oral tissue being destroyed that is disclosed in *Altshuler*. In fact,

Altshuler is completely silent as to the use of sound waves to diagnose teeth, and is instead focused on measuring the destruction of tissue. *Altshuler* thus does not disclose the claimed means for processing the detected shock waves to measure erythema in the tooth, and therefore does anticipate the claimed invention under 35 U.S.C. § 102. As a result, the anticipation rejections should be withdrawn.

II. Rejections in view of *Altshuler* under 35 U.S.C. § 103

As explained above, *Altshuler* lacks at least one element of the claimed invention. As a result, the combinations proposed by the Examiner to reject the claims as obvious do not form a *prima facie* case under 35 U.S.C. § 103. MPEP § 2143.03 (“To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art”). In addition, the combinations proposed by the Examiner would improperly alter the principle of operation of the primary reference and therefore cannot render the claimed invention obvious.

In particular, the Examiner proposed modifying the lasers of *Altshuler* to supply frequencies such as red light that allow for detection of oxygenated blood. The problem with this proposed modification is that *Altshuler* needs pulsed lasers to perform surgical operations and cause tissue necrosis. Modifying the lasers of *Altshuler* to deliver red light would therefore render the system completely useless for surgical procedures, as red light is incapable of causing the necessary destruction of tissue required in laser based surgical operations. As the Examiner’s proposed modification of *Altshuler* would necessarily change the principle of operation of the reference, the proposed combination fails to state a *prima facie* case of obviousness under 35 U.S.C. § 103. See MPEP 2143.01(IV)(“ If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the

teachings of the references are not sufficient to render the claims *prima facie* obvious). As a result, the obviousness rejections should be withdrawn.

III. Conclusion

A Petition for a Two Month Extension of the Time for Reply and authorization to charge any applicable fees to Deposit Account No. 50-1546 is submitted herewith.

In view of the foregoing remarks, the Examiner's reconsideration and allowance of the present application is believed to be in order. If the Examiner believes a phone conference with Applicant's attorney would expedite prosecution of this application, please contact the undersigned at (315) 218-8515.

Respectfully Submitted,

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